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INTRODUCTORY

ROYAL VICTORIA HOSPITAL

OPENING OF THE

THE ARMY MEDICAL

DAVID B. SMITH, M.D.

FIFTY-THIRD
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INTRODUCTORY LECTURE 15

DELIVERED AT THE

ROYAL VICTORIA HOSPITAL, NETLEY,

AT THE

OPENING OF THE 52ND SESSION

OF

THE ARMY MEDICAL SCHOOL,

2nd April 1886.

BY

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DEPUTY SURGEON-GENERAL :

PROFESSOR OF MILITARY MEDICINE.



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INTRODUCTORY LECTURE.

Surgeon-General Murray, Colleagues, and Gentlemen,—
Here around me I see those who are themselves high authorities on the subjects which I have now to speak of. I therefore experience a certain degree of diffidence in the presence of those who might fairly be severe critics of what I am about to say. Craving their indulgence, I must look in front of me, towards you—our new friends, for whom the following remarks are particularly intended.

In accordance with the wishes and directions of the Senate of this Army Medical School, it is my duty to address you on the present occasion. On behalf of my colleagues and myself, and I venture also to say in the name of Surgeon-General Murray, the Principal Medical Officer of this great institution, I desire very cordially to offer you a friendly welcome here, at the commencement of your Netley course of studies. In the past you have, all of you, completed your academic curricula at different schools of medicine throughout the United Kingdom, and you have taken degrees qualifying you for the practice of your profession.

In the future, you have before you the prospect of serving in her Majesty's Army Medical Department, both at home and abroad. At present, you are entering upon an intermediate stage of your career, which is of much

importance. You come to Netley to be initiated and trained by men of experience in the duties which will constitute the daily work of your future lives. There can be no possible doubt, therefore, that this initiatory or transition training period ought to be of great value to you in the future. If it be not so, it must be either your own fault or that of your teachers. I think you will find, Gentlemen, that your Professors will strive anxiously to do all that lies in their power to assist you; and I do not doubt that you, in your turn, will work zealously and steadily, so as to benefit by the splendid opportunities afforded you at this Army Medical School.

You have, all of you, no doubt, in the past, listened to many introductory addresses, infinitely more learned, more instructive, and more eloquent than that which I am now entering on; yet, anomalous though it may sound, and in spite of much personal disqualification (of which I assure you I am deeply conscious), I feel truly gratified and honoured at being permitted to address you on such an occasion as this, when each one of you, looking fondly back to his *Alma Mater*, is about to enter on a career of public service useful to the nation. There are, no doubt, some who may think and say that an introductory lecture addressed to you, who have already heard so many of them, must be peculiarly out of place and useless. I must confess that I can scarcely share this opinion. I believe that an introductory address is often stimulating, and therefore useful to those who hear it, like the familiar and often repeated yet inspiring word ‘*Forward*’ (or ‘*Charge*’) to the soldier.

On one occasion, while on active service, and when an enemy appeared in force before us, I had the pleasure of hearing a brave and very distinguished leader address a few hurried words to his troops, and I shall never forget the electric effect that those words produced. They led

to victory. We probably all remember, too, the stirring words, ‘*Up, Guards, and at them!*’ Well, Gentlemen (to compare very small things with great), if by any words of mine at the present time I may succeed in stimulating your feelings, and in pointing out your opportunity, I shall be fully satisfied and rewarded.

I now desire to speak to you *about Netley*; about the *plan, scope and objects of your studies here*; and of *certain general medical aspects of military service*.

Gentlemen, on May 19, 1856, her Most Gracious Majesty, our beloved Queen, laid the foundation-stone of this hospital, intended for the reception of the sick and wounded soldiers of her army. Circumstances, connected, I believe, with alterations in the original plans, delayed its construction for some years. It was completed in 1863; and I am now able to say (through the courtesy of Surgeon-General Murray, who has kindly had the figures collected and checked for me in his office) that the total number of soldiers that have passed through this hospital from March 13, 1863, to March 13, 1886 (i.e. during twenty-three years), amounts to 72,247; the largest number present within its walls at one time being 1,224 (on May 22, 1881). Many of the 72,247 were no doubt convalescents, who only remained a very short time; yet the actual number of sick and wounded soldiers who came here, invalided, from all parts of the world, was a very high one, and sufficient in itself to give some idea of the extent of the field for clinical observation and study which this school affords.

I have said that this institution owes its foundation to Royal favour; and many thousands of brave British soldiers have here been honoured and cheered by that sympathy and kindness which our Sovereign has been most graciously pleased to show them in their hours of pain and sickness, resulting from willing and loyal service

Laying of the foundation-stone of the Royal Victoria Hospital, Netley.
Its completion.

Number of patients in twenty-three years.

Her Majesty's visits to the Hospital.

to the Crown. Not many months ago, her Majesty's tender sympathy lightened and rejoiced the hearts of many disabled heroes returned from Egypt, who were thus 'soothed by the magic of a thought, and gladdened by a word.'

Laying of
founda-
tion-stone
of the
Netley
'Crimean
Monu-
ment' by
H.R.H.
the Prince
of Wales.

On August 1, 1864, his Royal Highness the Prince of Wales laid the foundation-stone of the Monument which stands almost in front of this hospital, and which was erected by their brother officers and friends, in memory of the officers of the Army Medical Department who died whilst serving with the army in the East during the war with Russia in 1854, 1855, and 1856. This monument bears the names of fifty-four faithful servants of the State.

Honoured
names as-
sociated
with the
early his-
tory of the
institu-
tion.

The
Prince
Consort.
Lord
Herbert.

The
Herbert
Prize.

Intimately associated also with the origin and early days of this school and hospital are the ever-to-be-honoured names of the late Prince Consort and of Lord Herbert, a statesman of surpassing eminence in relation to many army reforms which have proved of incalculable benefit to the country. He may be said to have been the distinguished founder of this Army Medical School, which has a separate existence, under the immediate control of the Right Honourable the Secretary of State for War. The Sidney Herbert Prize is here annually awarded to the Surgeon on probation who gains the highest number of marks in all subjects at Netley. This prize owes its origin to a great public meeting in London, over which H.R.H. the Duke of Cambridge (Field Marshal Commanding-in-Chief) presided, held in November 1861, for the purpose of perpetuating Lord Herbert's memory by suitable memorials. The result of this meeting was the erection of the statue which now stands in front of the War Office, together with the endowment of the prize to which I have above alluded. Proud indeed may be the feelings of the man who gains this distinction. Let us see which of you will this year be

the fortunate individual. I hope you will all have a good fight for it. Only let it be in the spirit of magnanimous rivalry and generous emulation. One thing you will all certainly have—viz. a fair field and no favour.

Gentlemen, right royal, noble, and distinguished as are the names which I have already mentioned, there are yet two others indissolubly connected with this school, both of which are worthy of profound honour and reverence. It is not without emotion that I speak of her who, many years ago—I believe at the suggestion of that great and good man Baron Bunsen—went to Kaiserswerth to study the nursing system there; who served her arduous practical apprenticeship at Paris, among the ‘*Petites Sœurs de Charité*’; who in the terrible days at Scutari laid the foundation of her renown in the great cause of the humanity of war, and whose name and works are the pride of her country. Worthy to be bracketed with the name of Florence Nightingale is that of Edmund Alexander Parkes. Ever and anon, in the course of time, a man appears in whom a splendid intellect is blended with the tenderness of a woman, and the innocence and purity of a child. Such a man must have wonderful influence over his fellow-men. Such a man was Edmund Parkes. An extraordinary magic and mastery still attach to his very name, although it is now ten years since he died. He was one who grew

Florence
Nightingale.

Edmund
Parkes.

Not alone in power
And knowledge, but from hour to hour
In reverence and in charity.

He was rich in that ‘crowning grace which thinketh no evil, which envieth not.’ Such a man can never die. It was, of old, said of Socrates that he was content that his friends should bury his body so long as they did not think that they buried Socrates. So, though in one sense

Edmund Parkes is gone, yet he still lives indeed—a friend to science; a friend to you and me; a friend to the British soldier and to the soldiers of all armies. I have read and heard many beautifully tender and touching things of this man. They always remind me of what was prettily said of Douglas Jerrold, I believe by Hepworth Dixon: ‘If every man who ever received a kindness at Jerrold’s hands were to cast a flower on his grave, the spot would be marked by a mountain of roses.’ So with Parkes. Although you and I may not have received kindnesses directly from his hand, yet all of us have received a priceless gift from him in the legacy of his writings and example; and we may therefore well claim the privilege of being permitted to offer the simple tribute of a flower to his memory. His earthly sun has set in beauty, and we (placed as we now are) can only admire the splendour and the loveliness of the afterglow. Goodness, like light, is diffusive. His goodness, like that light, has spread far and near. It is around us on all sides. As the venerable and amiable Bowditch once said of Louis: ‘Thrice happy they whose good fortune led them to know, to love, and to listen to him.’

Gentlemen, we would do well to imitate the fine qualities and the usefulness of one whose memory is enshrined in the hearts of all who knew him. His ‘Treatise on Practical Hygiene,’ edited by his very worthy and able successor, my distinguished colleague and friend, Professor De Chaumont, will be a very valuable guide to you in everything bearing on the application of that science to the surroundings and necessities of the soldier. The Parkes Memorial Bronze Medal is awarded at the close of each session at Netley to the Surgeon on probation who takes the highest place in Hygiene.

From what I have said before, you will perceive, Gentlemen, that the associations of this place are of a

Dr. Parkes’
successor,
Professor
De Chau-
mont,
F.R.S.

The
Parkes
Memorial
Medal.

high and noble order. We must strive to be worthy of them; whether teachers or taught, we must endeavour fully to maintain the good name, the dignity, and the honour of this institution. It may interest you to know that, since the foundation of this Army Medical School in 1860, 2,072 surgeons on probation have been trained here, and subsequently passed into the Service; besides these, 265 surgeons, while on leave, have studied here; making a total of 2,337 up to the present time.

The associations connected with Netley. The number of surgeons who have studied there up to the present time.

Now let me say a few words about the prospects before you. Although there may be (both from an administrative and an executive point of view) minor points connected with the Army Medical Services regarding which certain changes might with advantage be effected, yet I have no hesitation in declaring that the two great Services in which all of you here present are particularly interested—of course I mean the Army Medical and the Indian Medical Services—are such that you may be justly proud to think that you will (I hope all of you) belong to them before many months are over. In the course of years, these Services have, in many respects, been vastly improved. Entering them, you have now before you a career, as distinguished from a mere means of living. For those of you who are equal to the occasion, you will find ample scope for professional ambition, professional zeal, and professional distinction. I purposely repeat and emphasise the word ‘professional;’ because whatever may be your general abilities and tastes, whatever may be your attainments in the direction of the different social amenities of life, I venture to think that you will command no real respect, and gain no solid success, unless you show and prove that it is upon your profession, and upon that alone, that you take your real stand. Let your medical and surgical knowledge, your medical and surgical skill stand before everything else in your thoughts and estimation.

The prospects of young surgeons in the Army Medical Department.

Advice.

As medical officers, you will be amenable (and very properly so) to official routine, official rules and regulations, and official discipline; and it will be your duty strictly and readily to conform to all these. I would not for a moment have it supposed that I depreciate the importance of, or the necessity for, such restrictive conditions. They are undoubtedly necessities of a public military service, and they must not in any way be ignored or slighted. Moreover, it is very certain that ready and rigid obedience is quite compatible with self-respect and the most sensitive feelings. But what I desire to say is, that whilst you must not forget that you are Officers, your success and rewards will be greatest and best worth having if you subordinate everything else to love of your profession. I have, in the course of my service, seen and known some medical officers to whom their professional work appeared to be of very secondary importance. Some of them seemed to have mistaken their profession altogether. They would have been better fighting subalterns, or captains, majors, colonels, or generals, than army medical men, unless indeed (as I was sometimes inclined to think), had they been fighting men by profession, they might have wished to be something else. These are not the men for you to imitate. If, as I hope is the case, you really are deeply interested in and love your profession, then I can assure you that a very fine field is open before you. In your leisure moments, read of Jackson, McGrigor, Fergusson, Guthrie, Hennen, Paré, Petit, Percy and Larrey, and you will realise that professional work in the army is a thing worth living for. Above all things let professional zeal be your guiding star, and I have no doubt that you will be useful and happy men. If you are not thoroughly in earnest, however, about the career you have chosen for yourselves, and the work that now lies before you, failure will be your lot, and not success—I might

say contemptible failure. Some would-be clever young man at college once remarked that it was a great hardship to sit upon hard seats and listen to hard things. For him, perhaps, it was so. At the same time, I cannot help thinking that it was very hard upon the profession if he ever gained entrance to it. No, Gentlemen, you have much harder things than that before you; and I feel that it would be folly on my part to tell you that you may expect everything in the future to be *couleur de rose*. It will *not* be so; you cannot always remain in the groves and porticoes of philosophy; as George Eliot says, 'The world isn't made of pens, ink, and paper; and if you're to get on in the world, young man, you must know what the world's made of.' You must not only understand many things, but achieve many things. Yours is to be no cloister life—of mere dreamy contemplation and endless study. In more active scenes your usefulness must appear. The path before you cannot altogether be a smooth one; do not expect it. Train accordingly not only your mental but your physical energies. You are entering on a life which, although it demands all the intellectuality that you can possibly possess, all the special training that you can acquire, all the manipulative skill that you can attain to, must be a very varied life; one of activity, difficulty, and it may be of extreme danger, continually demanding largeness of knowledge and readiness of resource. Do not be deterred on this account. Triumphs may be as numerous as dangers; rewards are often in exact proportion to difficulties. Whether it will be so or not in your case will depend much upon yourselves. I like to think of the anecdote told of the great John Hunter. When, in the beginning of his career, he decided on establishing himself in London as a lecturer on anatomy and physiology, he engaged a room, and made it duly known to the students that, on a stated day, he would commence

Anecdote
of John
Hunter.

his course of lectures. He had provided a skeleton for his demonstration, but not a single student appeared. Hunter waited a short time, and then called the door-keeper. 'John,' he said, 'sit down here beside the skeleton, that I may at least begin by saying "*gentlemen.*"' So Hunter gave his first lecture to John and the skeleton. Curiosity brought some students on the second day; and soon it became difficult to find a room large enough to contain the crowds that flocked to his teaching. So much for pluck and determination. Some, if not all, of your aspirations will certainly be realised, if steadily and perseveringly acted up to. Rocks are stepping-stones, not obstacles, to the strong; 'dragons,' it has been said, 'make the Hercules.'

Advice.

I am anxious, on the present occasion, to fan the flame of moral determination and enthusiasm in your hearts, so deeply impressed am I with the conviction that without these primary qualities you cannot expect to succeed as army surgeons. Again, if you are not prepared readily and cheerfully to do what you are ordered to do and to go where you are ordered to go, if you are to say when ordered to one station that you would rather go to another, if you would rather think and argue than obey, if you would prefer a merely sedentary life to an active one, if you prefer fireside comfort and safety to enterprise, if the thought of certain hardships is too much for your nerves, if you are doubtful about your readiness and fitness for active service, if the prospect of discomforts and dangers is disagreeable to you, then I can only say that, in my opinion, you are not the men for the Army Medical Service. You would possibly do better elsewhere, although I am not quite sure even of that. At any rate, it is better that you should not serve at all than serve grudgingly in a public service. But I do hope that each one of you whom I am now addressing has more than a

little spark of ambition in his heart, that one and all of you are and may at all times be actuated by a burning, yet steady and well-directed, zeal in the sacred interests of humanity, and in the cause of Queen and country.

Let all the ends thou aim'st at be thy country's,
Thy God's and Truth's.

Gentlemen, recent campaigns in which the British Army has been engaged have presented a field for self-sacrifice which has not been lost on the Army Medical Department.

Recent
conduct
and losses
of the
Army
Medical
Service.

Three surgeons, Conolly, Stace, and Hewson, died during 1885 from illness contracted on active service in Egypt and the Soudan.

Surgeon-Major Porter died at Cabul on January 7, 1880, deeply lamented.

In March 1881, Surgeon-Major Cornish died at Mount Prospect, Transvaal, from wounds received at Majuba Hill.

At the same time, Surgeon Landon was killed in action at Majuba Hill.

In August 1882, Surgeon-Major Shaw was killed in action in Egypt.

Surgeon-General O. Barnett, C.I.E., died in July 1885, from illness contracted on service at Suakim, loved by all who knew him.

In March 1886, Surgeon Lane died of wounds received in action in the Eastern Soudan; and on 9th January, 1886, Surgeon Joseph Heath was killed in Upper Burmah, while endeavouring to rescue a wounded officer.

These were losses much to be deplored. 'Non-combatants' we may be called, and, for my part, I should be sorry to think that our proper vocation was ever lost sight of. Yet it is not the less true that we share dangers with

our brother officers of the combatant ranks; and the list of casualties that I have referred to amply proves how strongly actuated the Army Medical Service is by a sense of duty, loyalty and courage. Those whose names I have mentioned died in the willing performance of duty; and young though some of them were, they did not the less fulfil the object of their lives. As the pilgrim who dies on the road to Mecca is credited with the accomplishment of his pilgrimage, and derives all the advantages of it, so those who fall early in their career in a public service may yet be said to have accomplished their ambition, and to have triumphed as much as those who have lived longer. All those whom I have mentioned were faithful unto death; and the youngest of them was not afraid to perish in the cause of his country and in defence of his friend. As Cicero says: '*O fortunata mors, quæ Naturæ debita pro patriâ est potissimum reddita!*'

Different
courses of
study at
Netley.
The
Hospital.

Now let me say a few words regarding the different studies that will engage your attention here. In the hospital you will have to devote careful thought to the following subjects: The general routine of hospital visits; the maintenance of general order and regularity in a hospital; ward discipline; duties of orderly medical officers; the sanitary state of the wards; the regulations having reference to the equipment of military hospitals, and to the clothing and dietary of patients; the examination of invalids with reference to their fitness or unfitness for further service; the examination of recruits; the filling up of diet sheets; the preparation of dietary returns, stoppage rolls, requisitions for supplies and repairs; attention to order books; careful keeping of ward books, case books, admission and discharge books; the mode of carrying on official correspondence in medical matters, and of submitting reports; the treatment appro-

priate to special cases, such as may not as yet have fallen within your experience ; the history of diseases in relation to the previous life and service of the soldier ; the authorised mode of preparing, compiling and submitting statistical records.

In the subjects now referred to, you will be most skilfully and carefully instructed by officers of standing and experience, and of high qualifications—the Assistant Professors of Medicine and Surgery, Surgeons-Major Cherry and Godwin, who are in immediate charge of the sick, and whose duty and aim it will be to keep you well ‘up to the mark’ in everything connected with hospital work. You will find that they will do this with the one thought of assisting to make you thoroughly practical men.

I must now refer to the different courses of study conducted at Netley. It will not be necessary for me to enter on this topic at great length, as all the facts will be fully laid before you in detail by each of the professors at the commencement of his own lectures.

The
Netley
course of
studies.

The course of Hygiene consists of lectures and practical instructions bearing on preventive medicine and its special application to the preservation of the health of troops, in barracks, garrisons, stations, camps, and on the line of march. In this course cognisance is taken of many subjects, of which the following may now be mentioned : meteorology, including the use of meteorological instruments and the record of observations ; climatology, in its relation to disease ; physical geography ; medical topography ; the study of soils ; the geographical distribution of disease ; everything relating to habitations, barracks, tents, huts, hospitals, camps, water supply, rations, clothing, equipment, ventilation, drainage, &c. ; the general examination and chemical analysis of water, air, and food ; rules for the selection of military stations, camps, sanitarium, and

Hygiene.

sites generally ; the sanitary inspection of stations ; the sanitary condition of troopships and hospital ships ; the general conservancy of camps ; the personal hygiene of the soldier with reference to habits, training, drill, duty, &c. ; the study of contagion ; the laws and history of epidemics ; the study of the causes and prevention of disease, sickness, mortality, and invaliding in the army, both at home and at all foreign stations ; the subject of military vital statistics ; the illustration of many of the subjects above mentioned by drawings, diagrams, and models.

Pathology. The course of Pathology consists of lectures and demonstrations relating to the pathology and morbid anatomy of the diseases incidental to military life, the illustration by specimens of the morbid anatomy of tropical diseases, the study of parasitic diseases, the morbid anatomy of wounds and injuries, the careful investigation of the causes of death in particular cases, instructions regarding the performance of autopsies and the preparation of necrological reports in connection with Army 'medical history sheets.'

The course of Microscopy. The 'Microscopic' course comprehends careful practical instruction in the use of the microscope (each of you will be furnished with a microscope and everything necessary for the use of it) ; the methods of examining, measuring, and depicting microscopical objects ; instruction in the preparation and preservation of objects ; the examination of tissues and morbid products ; general microscopical demonstrations ; and instruction on the subject of bacteriology. In the laboratory of microscopical anatomy and pathology you will enjoy the great advantage of instruction at the hands of my excellent friend Surgeon-Major Lewis, the Assistant Professor of Pathology, himself a true student, an expert of the first order, and one whose researches and original observations are favourably known to the world.

If a bacillus has to be found, it stands a very poor chance indeed of escaping detection at Dr. Lewis' hands.¹

The course of Clinical and Military Surgery is of a special and practical character, and relates to everything connected with wounded men and the transport of sick. It embraces clinical instruction in the wards; the history of military surgery; the relation of military surgeons to other departments of the army; lectures on gunshot and other wounds; the transport of sick and wounded; the regulations for the Medical Staff Corps; the fitting up of transports and hospital ships; the selection and use of ambulances; the study of weapons and projectiles as it bears on gunshot and other wounds; the examination and selection of recruits; the study of surgical equipment and appliances; instruction regarding surgical arrangements on taking the field, on landing in an enemy's country, during and after an engagement, with a besieging force, during a retreat, within a besieged town or fortress. Lastly, the use of the ophthalmoscope and optical manipulation generally, as applicable to the testing of the eyesight of recruits and old soldiers. On this subject, Gentlemen, there is no higher authority than Professor Longmore, whose 'Optical Manual' will serve as your safe guide in all matters connected with the visual power of soldiers.

Military
Surgery.

Professor
Longmore,
C.B.

The course of Military Medicine consists of clinical instruction and of systematic lectures on the diseases of armies at home and abroad; their relative frequency and fatality as evidenced by army statistics; the history of military medicine; the medical history of armies and of different campaigns; the medical history of past army epidemics; the clinical characteristics, causes, and management of the diseases most fatal to the soldier at home; the description and treatment of tropical diseases, such as malarial fevers, cholera, dysentery, hepatic disease,

Military
Medicine.

¹ *Vide* the Postscript to this Lecture, p. 43.

malarial cachexia, spleen disease, sunstroke, yellow fever; the story of the results of all such diseases traced back to their causes; the history and peculiarities of particular cases coming from foreign stations, and their clinical bearings on service in tropical countries; instruction regarding hospital regulations, sick certificates, recruiting, invaliding, and hospital duties generally.

Instruction at the
Netley
Lunatic
Asylum.

In the neighbouring Military Lunatic Asylum you will have the great advantage of receiving practical instruction from Surgeon-Major F. H. Welch. The scope of his lectures will embrace all those considerations relating to insanity in the army which require to be carefully studied so as to carry out the instructions on this subject contained in the Regulations of the Medical Department of Her Majesty's Army and in the Army Act. You will thus learn what line of action you should pursue in the management and disposal of cases of mental disease when you find yourselves in medical charge of troops. To those of you who have already had instruction and experience on the subject of mental disease, Dr. Welch's course will afford valuable supplementary information. Those of you, on the other hand, who have already had little or no special training in this direction, will find the course most valuable, I might say indispensable, as you will thus acquire the practical knowledge necessary to enable you to act in such cases, when thrown on your own resources, after leaving Netley. These lectures will be essentially of a practical character, and they will be illustrated by cases, so that you will thereby come to understand the actual management of such cases on the asylum system. I would advise you to pay particular attention to this course, as I am sure you will find it of use to you in after life, when without that special training you might feel very much at a loss how to act in matters of serious difficulty and of grave responsibility.

Besides the hospital, the asylum, and the lectures, when you feel inclined to read and study quietly, you will be able to do so in the Library, which you will find contains all the books that you can require, or that you are likely to wish to refer to.

The
Library.

You should also devote some of your time to the Pathological Museum, one of the best of its kind in the world, and replete with valuable specimens, illustrative of the various subjects which are here studied. You will there see, amongst other things, a most interesting collection of seventeen water-colour drawings, executed by the late Sir Charles Bell, illustrative of wounds received at the battle of Waterloo. These drawings are masterpieces from the hand of the distinguished author of 'The Anatomy of Expression.'

The
Patho-
logical
Museum.

Besides the Pathological Museum there is the Museum of Models, illustrative of the subjects of military surgery, hygiene, transport of sick and wounded, and general hospital equipment.

The
Museum
of Models.

The Natural History collection of the Army Medical Department is also here, under the careful and able superintendence of Surgeon-Major Dobson. Commenced in 1829, under the auspices of Sir James McGrigor, Bart., and largely contributed to (from his private collection) by the late Director-General, Sir Andrew Smith, himself a distinguished naturalist, it was removed from Fort Pitt to Netley in 1863. Dr. Dobson, whose scientific attainments entitle him to speak with authority on such a subject—in his Report on the Museum for 1873—refers to the collection as, in many respects, unique, possessing species not to be found in any other museum in the world. Gentlemen, if there is a bat, a bird, a beetle, or a snake that you wish to know anything about, I would recommend you to go and have a talk with Surgeon-Major Dobson, who will soon tell you all about it. Here, in passing,

The
Natural
History
Museum.

I may mention that it will be my duty to instruct you regarding the most approved curative measures to be adopted in cases of snake bite, stings of scorpions, poisoned arrow-wounds, and the like—injuries which represent much loss of life in tropical countries.

Professor
Long-
more's
Intro-
duc-
tory Lec-
tures.

Gentlemen, I have now given you a brief sketch of the different courses of instruction carried on at Netley, and of the aids to learning that are available here. With reference to all these subjects I would strongly recommend you to read an Introductory Lecture which was delivered at Fort Pitt, Chatham, on the opening of the Army Medical School, by Surgeon-General Longmore, C.B. This was published in the Army Medical Blue Book for 1859; and it is followed by an equally important lecture, by the same gentleman, on the relations of the Medical Department and its officers to other departments of the army, and on the organisation of the Medical Department. You will find both of these lectures very instructive and useful to you.

Many sub-
jects to be
mastered
in four
months.

You will perceive, from what I have already said, that many of the subjects taught here are more or less new to you, yet of great practical importance; and it is very desirable that you should acquire as much knowledge regarding them as possible before you are placed in independent charge of troops. You will have ample opportunities; you will have experienced and willing instructors; and it will certainly be your own fault if you do not learn a good deal during the next four months.

The
opportu-
nities pre-
sented at
Netley.

When I entered the service, Gentlemen, I had, I regret to say, no such advantages as you now enjoy. After leaving collége, I had, like all other medical officers at that time, simply to pick up information as best I could; and had it not been my good fortune at the commencement of my career to serve under the orders of men of solid learning and of very wide experience, who

most kindly taught me much of what I now know, I should, from force of circumstances, have remained totally ignorant of many subjects of the first importance to an army surgeon: so that you see you really have, as it were, inherited very great advantages from the gradually developed and improved medical organisation of late years. Professor Tyndall tells us that, as a result of evolution, the European inherits from twenty to thirty cubic inches more of brain than the Papuan. Thus it happens that out of savages, unable to count up to the number of their fingers, and speaking a language containing only nouns and verbs, arise at length our Newtons and Shakespeares. I hope, Gentlemen, that if we who represent the students of a bygone day are to be regarded as the medical Papuans, you at least may prove to be the medical philosophers.

From what I have said of the course of study here, you will perceive that it is thoroughly practical, and that you have a good deal to get through in a short time. It will be very necessary, therefore, for you to be systematic in your method of working. John Stuart Mill said: 'Those who know how to employ opportunities will often find that they can create them, and what we achieve depends less on the amount of time that we possess than on the use we make of our time.'

Necessity
for me-
thodical
study.

I hope you do not come to Netley with the idea that you already know all about the subjects taught here. If you have any such impression your experience will probably end like that of the Frenchman who came to England, and who, after three weeks' residence, is said to have believed that he was quite competent to write an exhaustive work on Great Britain, describing everything connected with her laws, institutions, government, manufactories, industries, national wealth and prosperity. Three months later, it dawned upon him that he was not quite equal to the task; and after three years had passed away, he

Much that
is new
has to be
learnt.

Importance of having an exact knowledge of one's surroundings.

arrived at the conclusion that he really knew little or nothing about the country. The first condition of success in any line of study is to understand clearly what has to be done ; and secondly, how it is to be accomplished. I have tried to put you in possession of this sort of information as applying to your studies here, because I know that it is possible to travel fast and yet in the wrong direction, and that erroneous impressions, once formed, are not easily got rid of. The patriarchal gold fish thinks it is making great progress in an onward direction when, in point of fact, it is going round in circles, and it has been quaintly said that some minds are wonderful for keeping their bloom in the same sort of way.¹

The teaching at Netley is not unduly dogmatic.

I think you will find that the teaching afforded you here will be, not in the spirit of dogmatism, but in that of philosophical inquiry. We, your teachers, who have been students for the last thirty years or more, desire still to be your fellow-students, your fellow-learners, and your fellow-workers, knowing full well that there is no finality about so-called scientific conclusions, and that these are being constantly set aside and replaced by new facts. We, who have seen the empire of science widening so fast as to be scarcely recognisable, are not likely to lose sight of the fact that to teach is to learn. The army surgeon of to-day is surrounded by altogether new conditions as compared with those that existed twenty or thirty years ago. One of the early authorities on military surgery wrote as follows: 'Surgeons should be men of sobriety, of good conscience, and skilful in that Science, able to heal all sores and woundes, specially to take a pellet oute of the same.'² What would be the astonishment of the man who wrote these excellent maxims if he could only see some of our modern 'pellets'!—for instance,

The conditions surrounding the army surgeon have greatly changed.

¹ George Eliot.

² Introduction to Sir George Ballingall's *Military Surgery*.

the projectile of the 100-ton muzzle-loading gun, which I am informed by an excellent authority is 2,000 lbs. in weight, inclusive of a *bursting charge* of 75 lbs. of *gunpowder*, whilst it is driven by a *charge* of 450 lbs. of slow-burning gunpowder. This 'little pellet' is capable of penetrating twenty-three inches of iron at 1,000 yards, and twenty-one inches at 2,000 yards. Nothing more curiously indicates the great changes that are occurring in warfare, and consequently in the conditions under which soldiers are surrounded and army surgeons work, than the extraordinarily rapid advance in modern armament. But, Gentlemen, I feel that I must here apologise to my very distinguished colleague and friend, Professor Longmore, for presuming to allude to the subject of soldiers' wounds in his presence—he who, as you must know, is one of the very highest living authorities on the subject, and whose standard works on 'Gunshot Wounds' and 'Transport,' known to the surgeons of all armies, will furnish you with all possible information on these subjects.

Apology
due to
Professor
Long-
more.

Gentlemen, the ultimate object of your studies here is the preservation of the health of the British soldier and the efficiency of the army.

A very great deal has been done in this direction within the last twenty or thirty years. Before the date of the Crimean war our troops at home died at the rate of nearly 18 per 1,000; in 1883 the rate was 6·28 per 1,000, i.e. the mortality has been reduced to about one-third of what it was formerly.

Army
death
rates
greatly
reduced of
late years.

The mortality of European troops in India for the ten years from 1820 to 1830 was 90·7 per 1,000; in 1883 the rate was 10·88.

The mortality amongst the children of soldiers in India in 1875 was 69·75 per 1,000; in 1883 the rate was 46·88.

In 1858 the mortality from dysentery in the European army in India was 27·22 per 1,000; in 1883 it was ·38.

It would be very easy to adduce many further proofs of the happy changes that have occurred in the health of the army at home and abroad. It is not necessary, however, to do so at present. To know more about such changes, you should read the works of Henry Marshall, Sir William Smart, and Dr. Norman Chevers.

The causes
of these
happy
results.

The excellent results that I have already quoted (which really represent millions of money saved, and battalions of men) are due to the wisdom and the well-directed efforts of statesmen and sanitarians, and also to improved modes of treatment. Formerly a spoliative system of treatment was adopted for almost all diseases, which was more terrible than the diseases themselves. But as I shall have much to say to you on this subject in the course of my lectures I will not dwell on it at present. It would be impossible here to mention a tithe of the names of those who have materially assisted in lessening the sickness and mortality of the army. I will only allude to a few. Gentlemen, Sir Ranald Martin was to the day of his death an active member of the senate of this Army Medical School. He was one of the very first to recognise the fact that a vast amount of disease in the army was preventible. He was verily the pioneer of Indian sanitation, and his writings are of much interest and importance. To commemorate his name the Martin memorial gold medal is awarded at the close of each session of this school to the Surgeon on probation who takes the highest place in military medicine.

Those
who have
helped
to bring
them
about.

Sir Ranald
Martin.

Sir Joseph
Fayrer.

To Sir Ranald Martin's successor (as Physician to the Council of India,—I mean Sir Joseph Fayrer—we also owe much. Those of you who go to India will find that his name is still a household word there, and that it is still cherished and deeply respected. His position there was that of a leader. His services there, extending over a long course of years, were very important and useful; and since leaving India he has continued to work energetically for the good

of India and of the public Services. I shall often have occasion to mention his name to you in this theatre in connection with his valuable writings on subjects of tropical medicine, and I should like to add that my feelings towards him, after a friendship of more than twenty years, are those of unqualified admiration, esteem and respect.

Gentlemen, it would be a grave oversight were I now to pass over the name of Dr. Norman Chevers, who has been a very champion in the cause of Indian hygiene any time during the last thirty years. He is best known in India for his very classical work on Indian medical jurisprudence ; indeed, he has often been called the ‘ Alfred Taylor of India ; ’ and yet, profoundly learned though his writings are as a jurist, I am inclined to think that his labours as a sanitarian in India are even of yet greater value. He has written more fully and more ably on the preservation of the health of European soldiers and sailors in India than almost any other author, not even excepting Sir Ranald Martin.

Dr. Norman
Chevers.

There is another name, Gentlemen, which must always be associated with thoughts of the improved treatment of tropical diseases and with the better care of the British soldier. I refer to that distinguished man whom I had the honour to succeed in the chair of military medicine in this Army Medical School—Surgeon-General Maclean, C.B. Quite unable as I am to pass a fitting eulogium on one who has done so much for this school during a period of nearly a quarter of a century, I cannot, on such an occasion as the present, refrain from alluding to his career, his character, and his works. Before he came to Netley he was recognised by those high in authority as a man eminent in the public service and of very superior ability. For knowledge of his subject, valuable experience, cultivated mind, powers of eloquence and of lucid exposition, and I may add large-hearted disposition, it would be

Surgeon-
General
Maclean,
C.B.

difficult to find his equal. The mention of his name still strikes a chord in the hearts of many now in India and in all parts of the world, to whom he imparted—in this very theatre—much of his wide experience and varied learning. I am not the least overstepping the limits of strict accuracy when I say that I have, times without number, heard Dr. Maclean spoken of by his former Netley pupils in terms not only of great respect but of affectionate esteem. It would be most unjust and ungrateful on my part if I did not avail myself of a public opportunity such as the present to place on record the great obligation I am under to him for his most useful advice and ready assistance to me on the occasion of my taking up—this time last year—the duties of the Chair of Military Medicine here, and indeed ever since. He who so largely assisted, in his day, to establish and to teach sound principles of medicine, particularly as applied to the treatment of tropical disease, with an energy and force of character all his own, in handing me the torch, which I was proud to receive at his hands, did so in a spirit which showed what manner of man he was, his one thought being for the good of this school, in the interests of which he had worked so vigorously and efficiently for twenty-three years. On his retirement, Gentlemen, his many friends in the Services freely subscribed for an oil painting of him, which I am glad to say is now nearly completed, and which I hope may ere long find an honourable place here at Netley. Further, Gentlemen, it is a great pleasure to me to be able to tell you that Dr. Maclean is now engaged in collecting, revising, and partially re-writing his many valuable contributions on the subject of tropical medicine, which it is his intention soon to publish in the form of a new work, which will, I have no doubt, be hailed by the profession generally, and particularly by army surgeons. Gentlemen, I have yet one

more pleasant thing to say of Dr. Maclean, which will probably interest you. He has thoughtfully and generously expressed his wish to offer a prize, to be awarded at the end of the present Netley Session, to the Surgeon on probation who proves himself to be most efficient in medical ward work.

There are yet other names connected with Army associations which I would fain refer to. That eminent physician, the late Dr. Charles Murchison, was in his early days an army surgeon. At one time he held a Professorship in the Calcutta Medical College. I need not, I am sure, speak to those here present of his subsequent distinguished career, or of his works on continued fevers and diseases of the liver, which are simply masterpieces.

Other names connected with 'Service' associations.

Dr. Charles Murchison.

But even more famous men than those that I have mentioned have at one time of their career been associated with army service.

William Harvey, the immortal discoverer of the circulation of the blood, at one time saw field service, although in truth it must be confessed that he does not seem to have been of a combative nature. He was present at the battle of Edgehill on October 23, 1642. 'During the fight,' says Aubrey, 'the Prince and Duke of York were committed to his care. He told me that he withdrew with them under a hedge, and took out of his pocket a booke, and read. But he had not read very long before a bullet of a great gun grazed the ground neare him, which made him remove his station.'¹

William Harvey.

Gentlemen, the great John Hunter was an army surgeon. He saw active service in 1760 and 1763. Indeed, he rose to be Surgeon-General of the Medical Department of the British Army. Malgaigne in his essay on the 'History and Philosophy of Surgery,' published in Paris

John Hunter.

¹ Dr. Willis' *Life of Harvey*, and Monk's *Roll of the Royal College of Physicians*, vol. i. p. 130.

in 1847 (p. 32), wrote: 'Surgery as it was in the Middle Ages scarcely ranked above a common trade. In the hands of Paré and Petit it came to be honoured as an art. John Hunter raised it to the dignity of a science.'

A leading English surgeon, writing in the 'Medical Times and Gazette' in 1867, alluded to John Hunter as the greatest man in the medical profession, in ancient or in modern times, without excepting even the immortal discoverer of the circulation of the blood. It would be superfluous here to dwell on his having originated the mode of treating aneurism by ligature. It is certain that he, in a manner, foresaw that the operation of ovariectomy might one day become a legitimate and useful one. In a lecture delivered in 1785 he wrote: 'I cannot see any reason why, when the disease can be ascertained in an early stage, we should not make an opening into the abdomen, and extract the cyst itself.' This man, Gentlemen, who commenced life as a surgeon in the army, I need scarcely tell you, was the founder of that stupendous monument of anatomical and physiological research and learning, the Hunterian Museum of the Royal College of Surgeons.

Had I the desire to indulge in anything like special pleading in honour of army surgeons, I might say much more. I have, however, no such wish. I merely think it may interest you to hear of certain little 'Service' incidents connected with the names of those who have risen to distinction and fame

The bond
of union
between
the Civil
and
Military
Medical
Depart-
ments.

I hope, Gentlemen, you do not think that I am only capable of admiring 'things and men military.' It is not so. I yield to none of you in respect and admiration for our civil medical schools, and for the great men who are associated with them. Those schools may be said to be our common head-quarters, those famous men our generals; and we army surgeons may be regarded as passing much of our time on out-post duty, which it must

be allowed is, in every sense, a very important kind of work. None more than we do, can more profoundly reverence such names as Paget and Jenner (and others that might be mentioned), who so entirely and so deservedly command the respect of every member of our profession in all parts of the world. Gentlemen, I would fain see the bonds of brotherhood that exist between the Civil and Military Medical Services strengthened and drawn closer than they are at present. Already some splendid links unite us. If you ask me what these are, I reply: William Harvey, John Hunter, Edmund Parkes, Charles Murchison.

With reference to another very eminent member of our profession allow me to make the following remarks: Sir
Spencer
Wells,
formerly
a naval
surgeon.

In 1843 the operation of ovariectomy was denounced as 'so fearful in its nature, often so immediately fatal in its results, that whenever performed a fundamental principle of medical morality is outraged.' At the Medico-Chirurgical Society in 1850, Mr. Lawrence asked whether ovariectomy could be encouraged and continued without danger to the character of the profession! Less than a quarter of a century ago, writing after the date of the above denunciation, Lord Selborne, one of the most distinguished of English Chancellors, publicly stated the result of a calculation that by the first 500 operations performed by a certain living surgeon, 10,000 years had been added to the lives of European women. The same surgeon has very recently published a valuable work in which it is shown that he had (at the date of the publication of this work) performed the operation (of ovariectomy) in the case of 1,139 patients, of whom 891 have recovered; and I have his authority for now mentioning that up till March 15, 1886, he had performed 1,154 complete ovariectomies. As the success attending his later cases has been much greater than that of his early operations, we may fairly say that he has, in- His
services to
humanity.

dividually, been the means of adding something like 25,000 years to the lives of English women. What the total gain from this single operation must have been, as the result of its performance by surgeons in all parts of the world, it is difficult to estimate, but it must be something truly grand. It is, I am sure, scarcely necessary for me here to state who the very distinguished surgeon was by whose influence, in the face of fearful opposition and obloquy, such results as those I have above stated were obtained—such almost unparalleled blessings to humanity. You must all know, Gentlemen, that I refer to Sir Spencer Wells, Bart., late President of the Royal College of Surgeons of England.

Let me read to you the following words, taken from an address on Surgery delivered at Manchester by the same distinguished surgeon on Thursday, August 9, 1877. After alluding to the results of his operations up to that date, he remarked: ‘I should not venture to say all this if it were not by way of encouragement to every one who hears me to do the work which comes before him whatever it may be. Nothing could be more unlikely than that I, up till 1855 a naval surgeon, serving in 1855 and 1856 with the army in the Crimea—never having till that time treated a single case of ovarian disease—removing an ovarian tumour for the first time in 1858, and waiting three years before I had done ten cases, should now be able to say’ (that was in 1877) ‘that I have completed the operation on 868 women.’

As I have before stated, up to the present time his operations number 1,154. Thus you see that the revival of ovariectomy, and much of the signal success and benefit that has resulted from the operation, is greatly due to one who, in his day, served as a surgeon in her Majesty’s public service. But this is not all. In his inaugural address delivered at Birmingham on November 5, 1884

(alluding to what he observed in the Crimea), Sir Spencer Wells remarked: 'I did see cases of abdominal wounds which taught me that the peritoneum would bear much rougher handling than I had previously believed permissible.' And again: 'I had learnt in the Crimea that a man's abdominal wall might be lacerated by fragments of shell, his intestines protruding and covered with mud, so remaining for several hours; and yet, after careful cleansing of the cavity and accurate closure of the wounds, complete recovery was possible. When I returned to London in 1856, I was certainly much less afraid than before of abdominal wounds.'

Not very long after this, in February 1858, he had his first successful case of ovariectomy, so that I think we may fairly say that military surgery had a direct and important influence upon the revival of ovariectomy; and further, it is to me very interesting and gratifying to quote another sentence from the address of 1884. It is this: 'The first three women upon whom I performed ovariectomy all recovered; the fourth died, without, as I thought, any good reason why she should have died. I was naturally much interested in the *post-mortem* examination, and I obtained the invaluable services of my friend Dr. Aitken to make it.' After this comes the statement of the observations then made and the reasonings based upon them, which directly led Sir Spencer Wells afterwards to alter his mode of operating in a very important particular; this alteration being based on the principle that serous membranes when divided ought to be brought together directly and firmly, surface to surface, and not by the mere apposition of the opposite edges.

Professor
Aitken,
F.R.S.

The recognition of this principle, and the practical changes which followed it, 'enabled him to arrive at the best mode of uniting penetrating wounds of the abdominal wall.' So that, for this important modification of the

manner of performing ovariectomy, we are to a certain degree indirectly indebted to my very learned colleague Professor Aitken, who, I should add, himself did eminently useful service as a pathologist at Scutari in 1854, and whose observations on the effects of climate, and of slow degenerative changes resulting from it, as influencing the efficiency of an army, present us with a truly fine example of keen and subtle scientific analysis of a wide and difficult subject. Every army surgeon may find instruction by perusing Professor Aitken's report in the 40th volume of the 'Medico-Chirurgical Transactions,' on the effects of twelve weeks' residence in Bulgaria on the subsequent health of the British troops in the Crimea.

Gentlemen, in the Pathological Department here you will have the immense advantage of benefiting by Professor Aitken's profound learning; while, for purposes of study and reference, you have the seventh edition of his great work on the 'Science and Practice of Medicine,' which for comprehensiveness of detail and profundity of learning is almost unequalled. As was once said of Hirsch's 'Hand-book of Geographical and Historical Pathology,' 'it is a library in itself.'

A few words especially addressed to those whose career will be in India.

Gentlemen, to those of you whose future career will be in India, I desire to say a few words. You will there find a splendid field for your energies. The best years of my life were spent in India, and I look back to the country, its associations, and its people, with peculiar interest. I was there in the dark days of the Indian Mutiny, and I then witnessed many scenes which it is well to try to forget. I am glad to lose the recollection of them all in the thought of the progress that Western civilisation has made in that great empire since those sad days.

When I went to India, I believe I am correct in saying that there were not more than 150 miles of railway

throughout the whole country; and telegraphs were then very few and far between. There were no universities, and only two or three medical schools. Now there are four very important universities, and a goodly number of excellent medical schools. The total length of railway open for traffic during the year 1883-84 was 12,004 miles; and the total number of passengers carried during the year amounted to 73,815,119. The length of telegraph wire now extends over 68,000 miles.

Wonderful changes that have recently occurred in India. Railroads, telegraphs, universities, medical schools.

There is one very important innovation which has occurred in India quite within my recollection; and as it closely bears on the subject of the most destructive of tropical diseases, I avail myself of the present opportunity of speaking on this subject, viz. *the introduction and cultivation of cinchona in India*.¹

The first cinchonas ever seen in Europe were some *Calisaya* plants raised at the Jardin des Plantes, from seeds collected by Dr. Weddell during his first journey to Bolivia in 1846.

Cinchona cultivation in India.

It was not until 1858 that the despatch of a special agent to South America was sanctioned by the Secretary of State for India. In 1860, under the direction of Mr. Clements Markham, a triple British expedition was organised to collect seeds and seedlings in the cinchona forests of America. Mr. Markham himself explored the forests of Bolivia and *Southern* Peru. Mr. Pritchett explored the grey bark forests in *Central* Peru, while the work of Messrs. Spruce and Cross lay in the collection of the seeds of the red bark tree on the eastern slopes of Chimborazo, in the territory of Ecuador. These gentlemen, after much hardship and exposure, completed their expeditions. The

¹ The following remarks on this subject as they now appear have been somewhat amplified. On the occasion of the delivery of this Lecture they were, from want of time, considerably abbreviated. The story of cinchona cultivation is now submitted in outline.

Calisaya plants collected by Mr. Markham reached England in a promising state, and they continued in that condition until they reached Alexandria. On their arrival, however, in the Nilgiri Hills (Madras) they were all in a dying state. Some cuttings were made from them, but not one of these struck root. The fate of Mr. Pritchett's plants of grey bark was quite as unfortunate, for they reached India either dead or dying. Mr. Cross's plants of *Succirubra*, raised from cuttings at Limon, together with six *Calisayas* which had been raised at Kew in 1862, were the only living cinchona plants collected by Mr. Markham's triple expedition that reached India in good condition. Mr. Cross deposited his plants in Mr. McIvor's hands at Ootacamund on April 19, 1861, in excellent order. The supplies of *seeds* procured by the three expeditions were more fortunate than the plants. These were sent to the Royal Garden at Kew, where some were retained and sown. A few of the plants brought from South America were also retained at Kew, so that a sort of reserve dépôt was formed there, in case of failure in India. The seeds not retained at Kew were sent to India, and they arrived at the Madras Hills in the early part of 1861.

Meanwhile Dr. Thomas Anderson, Superintendent of the Royal Botanical Garden, Calcutta, had been sent by the Indian Government to Java, with the double object of familiarising himself with the Dutch mode of cultivation and of conveying to India the plants which the governor of that colony had generously offered to the Government of India. Dr. Anderson returned from Java in November 1861. In December of the same year he went to Ootacamund, and made over to Mr. McIvor, Superintendent of the Government Garden there, the plants he had brought from Java. On March 4, 1862, Mr. Cross's collection of pale bark seeds from Loxa (a town in the south of the Ecuador territory) arrived at Madras, and the introduc-

tion of cinchona to India thus became an accomplished fact.

I must pass over many interesting particulars regarding the selection of localities most suitable for the cultivation of cinchona in India. I must also reluctantly pass from all further mention of what has, since the year 1862, happened at Madras. I shall endeavour, in as few words as possible, to tell the story of cinchona cultivation in Bengal. The first cinchona seeds received by Dr. Anderson were some that were sent by Sir W. J. Hooker to the Botanical Gardens, Calcutta, in 1861. In December of that year these had produced thirty-one plants. I have already mentioned that Dr. Anderson went to Java in the same year, and that he made over all the plants that he brought from there to the Madras Gardens. In return he took to Calcutta from Ootacamund 193 plants of *Succirubra* and of the species yielding grey bark. Some of the Java plants died in Calcutta, and on January 19, 1862, the total stock of plants in the Botanical Gardens there from all sources consisted of 289 plants. Dr. Anderson recommended that these should be sent to Sikkim, that being the part of the Himalayas which offered, in his opinion, the greatest hope of success. Government sanctioned this proposal, and in March of the same year Dr. Anderson proceeded to Darjeeling, accompanied by a gardener in charge of the 289 plants. Numberless difficulties were at first encountered, and but for Dr. Anderson's indomitable energy and perseverance the entire experiment must have proved a failure. But he was not a man to yield; indeed, he worked vigorously in this good cause until, much to the regret of all who knew him, his life was sacrificed in 1870, from the great exposure and fatigue incidental to his unceasing exertions in the hot steamy valleys of Sikkim. Nurseries were established at different places in British Sikkim, one at

Lebong near Darjeeling, and another at Rungyroom. In June 1864 ground was broken in the Rungbee Valley, at a spot 4,410 feet above the sea level, and here a plantation grew up. The first and only planting done during the year 1864 was a patch containing 523 plants of five different species of cinchona. Propagation by cuttings of *C. succirubra* and *C. officinalis* went on vigorously during succeeding years. It gradually became apparent that *C. officinalis* does not thrive in Sikkim. Of *C. succirubra* there were on April 1, 1875, 2,390,000 trees; at the same date there were 354,500 trees of *Cinchona Calisaya* or yellow bark, besides young plants in the nurseries. From the commencement of the operations in Sikkim up till April 1, 1875, the total number of cinchonas of different varieties was 3,285,592; and the total number of acres of land that had been so planted amounted to 1,939,442. The total money expenditure up to the date just mentioned, including all quinological charges, had been Rs. 6,46,243. The total revenue up to the same date amounted to Rs. 7,958, so that the plantation up to that date (April 1, 1875), i.e. exactly eleven years ago, had not as yet begun to be worked for revenue.

Now, Gentlemen, it is impossible for me to give you, even in outline, the story of all the subsequent operations from 1875 onwards. I will, however, give you the results brought up very nearly to the present time. But first let me tell you that that very distinguished botanist, Dr. Thomas Anderson, was succeeded in this great work by one who has proved himself splendidly worthy of the position. I mean my excellent friend, Dr. George King, the present Superintendent of the Royal Botanical Garden, Calcutta, and of cinchona cultivation in Bengal, and Professor of Botany in the Calcutta Medical College. Dr. King has published a 'Manual of Cinchona Cultivation in India.' It is from this work that I have taken all the facts which I

Very
valuable
services of
Dr. George
King,
Superin-
tendent of
the Royal
Botanical
Garden,
Calcutta.

have now placed before you regarding the introduction of cinchona into India, and to Dr. King I am further indebted for a series of his annual reports to the Government of Bengal from the year 1875. Before and ever since that time he has done invaluable service to the State and to science, with characteristic ability and modesty. No one could possibly have been more appreciative of the labours of others than he has been. No one could more generously have acknowledged and recorded them. Associated with him has been one whose name cannot possibly be omitted from the narrative of cinchona cultivation in India. Since 1866, the Sikkim plantations have been under the executive charge of Mr. J. Gammie, the resident manager, and to him (as Dr. King has, year after year, reported) their success has been largely due. I must tell you that for a number of years back cinchona febrifuge has been largely manufactured at the Government plantations in Sikkim as a substitute for quinine, with the results which I shall now lay before you, as they are set forth in a Resolution of the Government of Bengal, dated Darjeeling, June 19, 1885.

The total number of trees of all kinds on the plantation at the close of the official year 1883-84, was 4,912,111. The crop of the year amounted to 339,201 lbs. of dry bark, of which 325,125 lbs. were red, and 14,076 lbs. were yellow. The annual expenditure on the plantation amounted to Rs. 81,726. The revenue derived during the year from the sale of the febrifuge, seed, plants, and bark, amounted to Rs. 1,24,225. The total amount of money sunk by the Bengal Government on the cinchona plantations and factory since 1862 amounted to Rs. 10,84,202, which has been recouped more than twice over by the saving effected by the substitution of cinchona febrifuge for quinine in Government medical institutions. Looking to this result, and to the good that it represents as having

The wonderful results, general and financial, of cinchona cultivation in India.

been effected for the benefit of the people of India, I have no hesitation in saying that it implies a glorious triumph alike of science and of administration. Gentlemen, some years ago I rode for miles through the cinchona plantations of British Sikkim, and I then sat me down and calmly enjoyed a cigar in the shade of some of those very trees the early history of which I have been tracing, and in doing so I fully realised the truth of the saying :

He that flings away a seed destroys
The future harvest of a hundred fields.

I trust that the outline which I have now given of a very important subject, closely connected with that of tropical medicine, may to some extent have interested you.

These
happy
results
greatly
due to
Dr. King.

I cannot conclude my remarks on this subject without asking you to cast your eyes on the wall to my right, where you will see the name of George King, Netley prizeman of the 11th (winter) Session 1865-66. I may add that the records of the school show that he came out as the *first* man of his batch in the *London* examination, and that he maintained his position as the first man in the *Netley* examination. In those days this school had *no prizes* to offer ; the highest honour then consisted in having one's name placed on that wall tablet to my right, on which I see the names of a good many others who have distinguished themselves in India, or elsewhere, since they left Netley. I anxiously trust that some of you may live to carry out work as useful as that of my friend Dr. George King.

His
example
to be
followed.

Conclud-
ing re-
marks and
words of
advice.

And now, Gentlemen, I think it may possibly be expected of me that I should give you a few formal words of friendly advice besides those that I have already incidentally offered. Unfortunately I feel that I was never meant for the writing of sermons or for preaching. But there are

two or three points upon which I will touch very briefly before we part, asking you to receive my remarks in the spirit in which they are offered. One essential point, I take it, in all professions is conveyed in the words *Be thorough*. Do not permit yourselves to have false pretensions of any kind. Do nothing in a careless, slipshod way. Thoroughness and solidity in work are far better than brilliancy and display. Try to acquire a complete, conscientious, and accurate knowledge of your subjects. Think deeply, think accurately, and think and work honestly. Despise the man who ‘scamps’ his work, and remember that ‘to do what you do well should be the first thing, the wages the second.’¹ Another point essential to success is the necessity of devoting the utmost possible care and attention to so-called small matters of detail—in a word, to minutiae. I attach particular importance to this in army work of all kinds. But of course it holds good generally. I believe it was St. Augustine (or some other worthy old Father of the Church) who wisely said: ‘God is great in great things, but greatest in the small.’ You cannot possibly be ‘thorough’ without paying full attention to minutiae; and I believe it to be quite true that ‘neglect and depreciation of intellectual minutiae are characteristics of the ill-informed;’² whilst scrupulous care and accuracy in the minutest details of scientific truth is the aim and object of all great minds.

Professor John Goodsir of Edinburgh was once engaged in conducting certain very important and interesting microscopical observations with his assistant. Apprehensive lest the smallest inaccuracy might creep into the record of facts, he exclaimed in an anxious tone of voice: ‘Now, Mr. Stirling, let us have God’s truth in these

¹ Froude.

² Martineau.

measurements. God's truth in everything. I live for that.'

If it will not be taxing your patience, Gentlemen, I should like to tell you two other short and simple anecdotes of this same John Goodsir, than whom I do not think I ever knew a man of more philosophic mind. They are both illustrations of his surpassing love for his own proper work, anatomy.

At one time he required change and mental rest. With this object in view he was recommended to take a trip on the Continent. He did so. On his return a friend asked him how he had enjoyed his holiday. In reply he exclaimed with his characteristic fervour, 'Oh, very much indeed; I spent six hours a day in the Museum with Müller, Hyrtl, or Kölliker'! He could not get on at all without his anatomy. It was a constant and unfailing source of happiness to him. His favourite study was to him a worship.

And now for my second anecdote about this truly great man: I was once travelling with him for a short distance in Fifeshire. We were in a railway train. We passed a broad deep bay at very low tide, which I must say looked very forbidding. Professor Goodsir, looking at the (to me) dreary scene with evident delight, observed, 'Ah! some of the happiest moments of my life were spent there with Edward Forbes.' These two great naturalists had together hunted up their favourite mollusca on that slimy spot (Anstruther Bay); and the thought of their anatomy was evidently still vibrating in Goodsir's soul. We went on, and soon had to go on board a small steamer to cross the Firth of Forth. The weather was very boisterous, and we were both holding on to the bulwark of the vessel (and to our hats!) The time and scene were certainly not favourable for thoughts of science. But Goodsir, after asking

me about my experiences in India (whence I had returned a short time before), raising his voice in the very teeth of the wind, said, 'Did you know Dr. Fayrer, sir, in India?' I replied that I did; that we were personal friends. Upon which Goodsir exclaimed fervently, 'I shall never forget his kindness, sir; he sent me the skeletons of two Hindoos'! At the very thought, although the elements were warring around us, Goodsir's eye brightened with delight, and he smiled with inward joy as he thought of those skeletons of two Hindoos. Under every conceivable circumstance in life anatomy was his delight. On his tomb appear only these significant words, 'John Goodsir, anatomist.'

Another point, Gentlemen, of much importance for your success is the exercise of good judgment; this is very necessary in army surgeons. One of the former Viceroy of India used to say: 'There are three things I want in young men—integrity, zeal, and judgment. Well, let us take it for granted that every gentleman has integrity. Zeal (he continued) without judgment is like a bull in a crockery shop; and judgment without zeal always reminds me of a locomotive without fuel.'

Gentlemen, I know of no service in which integrity, zeal, and judgment are more absolutely essential than that which you will shortly enter. Without integrity, as you know, any man must be despicable. Without zeal in the army you will languish and do no good. Without common sense, tact, and judgment, you will be constantly making mistakes, entailing annoyance, confusion and failure.

Gentlemen, Mr. Ruskin, a high authority on such a subject, has (if I properly understand his curious eloquence) said that no true artist ever did really good work unless he was happy when he did it. Whether this is strictly correct or not, it is certain that one of the great secrets of

happiness in life is to make our daily routine work a constant source of pleasure to ourselves. General Gordon—the great Soudan Gordon—said: ‘I am sure the secret of true happiness is to be content with what we actually have; and,’ he added, ‘we raise our own goblins’! Horace, whom I hope you all study and admire, was certainly very strongly of the same opinion. His many maxims on this point, although familiar, are always delightful. It appears to me that the following may be accepted as a free and homely translation of them all put together: ‘Be aisy (i.e. happy); and if you can’t be aisy, be as aisy as you can.’ In other words, ‘Cheerfulness is half the battle.’ If ever you feel inclined to be down-hearted (which I hope you may never be), ‘pull yourself together,’ as the familiar but expressive saying is. Don’t yield! Remember the words:

Man! what is this, and why art thou despairing?
God will forgive thee all but thy despair.

So you see, Gentlemen, my advice to you briefly lies in a few familiar phrases: Be thorough. Look carefully to small matters. Love daily routine work. Be judg-matic. Be cheerful. Never give in. And I would also add, Be jealous of the honour of our profession. Extend the limits of scientific truth, if you can possibly do so. Be nobly ambitious. Bear always in mind the words so highly prized by every soldier: *duty, honour, Queen, country*. Have courage to do what is right at all hazards—courage not only to risk life, but, if need be, to sacrifice it. ‘The only failure a man ought to fear is failure in cleaving to the purpose he sees to be best.’¹ ‘Be loyal and chivalrous; gentle and strong; modest and humble; tender and true; pitiful to the weak.’²

¹ George Eliot.

² Charles Kingsley.

Gentlemen, I feel that I must ask you to forgive my attempt at sermonising. And now I have but five words more to add, and I desire to address them to each one of you individually, with all the sincerity that my nature is capable of. These, I believe, were the golden words of the great traveller Livingstone—

FEAR GOD AND WORK HARD.

POSTSCRIPT.

With feelings of deep sadness I here record the fact that, since this Lecture was delivered, my dear friend Dr. Lewis has passed away from this world—another martyr to Science. Remarkable for great manipulative skill as a Microscopist, depth of learning, honesty of observation, and a winning sweetness of character that endeared him to all who knew him, his name and memory are borne in tender remembrance at Netley, alike by his pupils and his colleagues—

Multis ille bonis flebilis occidit,
Nulli flebilior quam mihi.

